

## IN THE CLAIMS

1. (Currently Amended) A method of communication, comprising:

assigning at least one channelization code to ~~a data packet~~ each of a plurality of data packets; ~~[[and]]~~

assigning ~~at least a portion~~ portions of power available for communicating to at least a subset of the channelization codes ~~[[code]]~~ based on a plurality of channel quality metrics ~~[[metric]]~~; and

iteratively determining values for the portions of the power and the number of channelization codes to optimize a capacity of a channel for communicating the data packets.

2. (Currently Amended) The method of claim 1, further comprising ~~wherein assigning the channelization code further comprises assigning at least one channelization code to each of a plurality of data packets, assigning the portions of the power further comprises assigning portions of the power available to at least a subset of channelization codes based on a plurality of channel quality metrics, and the method further comprises:~~

determining the portions of the available power to be assigned based on the channel quality metrics and a first optimization parameter;

determining the values of the number of channelization codes assigned to the data packets based on the determined portions of the available power and a second optimization parameter; and

repeating the determining of the portions of the available power and the determining of the values of the number of channelization codes.

3. (Currently Amended) The method of claim 1, further comprising wherein ~~assigning the channelization code further comprises assigning at least one channelization code to each of a plurality of data packets, assigning the portions of the power further comprises assigning portions to at least a subset of the channelization codes based on a plurality of channel quality metrics, and the method further comprises:~~

determining the number of channelization codes assigned to each data packet based on a size of the data packet and one of the channel quality estimates associated with the data packet;

determining the portions of the available power to be assigned to each of the channelization codes based on a first optimization parameter; and

repeating the determining of the number of channelization codes and the determining of the portions of the available power.

4. (Original) The method of claim 3, further comprising:

terminating the repeating responsive to the assigned channelization codes in a first iteration being the same as the assigned channelization codes in a second later iteration; and

truncating the subset of assigned channelization codes based on a maximum number of allowable channelization codes.

5. (Currently Amended) The method of claim 1, wherein optimizing the capacity further comprises optimizing ~~assigning the channelization code further comprises assigning at least one~~

~~channelization code to each of a plurality of data packets, assigning the portions of the power further comprises assigning portions to at least a subset of the channelization codes based on channel quality metrics associated with the data packets, and the method further comprises assigning the channelization codes and the portions of the available power to optimize a Shannon capacity of [[a]] the channel for communicating the data packets.~~

6. (Currently Amended) The method of claim 1, further comprising ~~wherein assigning the channelization code further comprises assigning at least one channelization code to each of a plurality of data packets, assigning the portions of the power further comprises assigning portions to at least a subset of the channelization codes based on channel quality metrics associated with the data packets, and the method further comprises~~ prioritizing the plurality of data packets.

7. (Original) The method of claim 6, wherein prioritizing the plurality of data packets further comprises:

identifying a plurality of quality of service classes;

assigning a predetermined amount of the available power to each of the quality of service classes; and

assigning the channelization codes and the portions of the available power based on the predetermined amounts for each quality of service classes.

8. (Original) The method of claim 6, wherein prioritizing the plurality of data packets further comprises:

identifying a plurality of quality of service classes;

assigning the channelization codes and the portions of the available power for a first class of the quality of service classes;

determining a remaining amount of the available power after the assigning for the first class; and

assigning the channelization codes and the portions of the available power for a second class of the quality of service classes based on the remaining amount of available power.

9. (Original) The method of claim 6, wherein prioritizing the plurality of data packets further comprises:

identifying a plurality of quality of service classes;

combining all data packets in the plurality of quality of service classes;

sorting the combined users based on a fairness algorithm; and

assigning the channelization codes and the portions of the available power based on the sorting.

10. (Currently Amended) A method of communication, comprising:

providing a channel quality estimate; and

extracting a plurality of data packets ~~data-packet~~ encoded with a plurality of  
channelization ~~[[code]]~~ codes from a signal, the channelization ~~[[code]]~~ codes and  
~~[[a]]~~ power fractions ~~[[fraction]]~~ associated with the signal being assigned based  
on the channel quality estimate by iteratively determining values for the power  
fractions and a number of channelization codes in the plurality to optimize a  
capacity of a channel for communicating the data packets.

11. (Original) The method of claim 10, further comprising initiating a communication link over a channel, the communication link being assigned to a quality of service class having a predetermined transmit power assignment and the power fraction is based on a portion of the predetermined transmit power.

12. (Currently Amended) The method of claim 10, wherein ~~extracting the data packet~~  
~~further comprises extracting the data packet encoded with the channelization code from the~~  
~~signal received over the channel, wherein~~ the channelization ~~[[code]]~~ codes and the power  
fractions ~~[[fraction]]~~ associated with the signal are assigned based on the channel quality  
estimate to optimize a Shannon capacity of the channel.

13. (Currently Amended) The method of claim 1, further comprising:

generating a cost function using a channel capacity equation having a first constraint, the cost function including a first optimization parameter associated with the first constraint;

determining a value for the first optimization parameter based on a first order derivative of the cost function; and

assigning at least one of the channelization ~~[[code]]~~ codes and the ~~[[portion]]~~ portions of power available for communicating based on the first optimization parameter.

14. (Currently Amended) The method of claim 13, wherein ~~assigning the channelization code further comprises assigning at least one channelization code to each of a plurality of data packets, assigning the portions of the power further comprises assigning portions of the power available to at least a subset of channelization codes based on a plurality of channel quality metrics,~~ the first constraint and first optimization parameter are associated with the power available for communicating, and the method further comprises determining the portions of the available power to be assigned based on the first optimization parameter.

15. (Original) The method of claim 14, further comprising:

defining a second constraint for the channel capacity equation based on the channelization codes, the cost function including a second optimization parameter associated with the second constraint; and

determining the values of the number of channelization codes assigned to the data packets based on the second optimization parameter.

16. (Currently Amended) A communication system, comprising:

a transmitter adapted to communicate data packets; and

an allocation unit adapted to assign at least one channelization code to ~~a data packet~~ each of a plurality of data packets, ~~[[and]] assign a portion~~ portions of power available for communicating to at least a subset of the channelization codes ~~[[code]]~~ based on a plurality of channel quality metrics ~~[[metric]]~~ associated with the data packets ~~[[packet]]~~, and iteratively determine values for the portions of the power and the number of channelization codes to optimize a capacity of a channel for communicating the data packets.

17. (Currently Amended) The system of claim 16, wherein the allocation unit is further adapted ~~to assign at least one channelization code to each of a plurality of data packets~~, determine portions of the available power to be assigned to at least a subset of the channelization codes based on the channel quality metrics and a first optimization parameter, determine the values of the number of channelization codes assigned to each data packets in the subset based on the determined portions of the available power and a second optimization parameter, and repeat the determining of the portions of the available power and the determining of the values of the number of channelization codes.

18. (Currently Amended) The system of claim 16, wherein the allocation unit is further adapted ~~to assign at least one channelization code to each of a plurality of data packets~~, determine the number of channelization codes assigned to each user in the subset based on a size

of the data packet and the channel quality estimate associated with the data packets, determine portions of the available power to be assigned to at least a subset of the channelization codes based on a first optimization parameter, and repeat the determining of the number of channelization codes and the determining of the portions of the available power.

19. (Original) The system of claim 18, wherein the allocation unit is further adapted to terminate the repeating responsive to the assigned channelization codes in a first iteration being the same as the assigned channelization codes in a second later iteration.

20. (Currently Amended) The system of claim 16, wherein the allocation unit is further adapted to ~~assign at least one channelization code to each of a plurality of data packets and~~ determine portions of the available power to be assigned to at least a subset of the channelization codes based on channel quality metrics associated with the plurality of data packets to optimize a Shannon capacity of a channel for communicating the data packets.

21. (Original) The system of claim 16, wherein the allocation unit is further adapted to prioritize a plurality of data packets, assign at least one channelization code to at least a subset of the of the plurality of data packets and determine portions of the available power to be assigned to at least a subset of the channelization codes based on channel quality metrics associated with the plurality of data packets.

22. (Original) The system of claim 21, wherein the allocation unit is further adapted to identify a plurality of quality of service classes, assign a predetermined amount of the available



power to each of the quality of service classes, and assign the channelization codes and the portions of the available power based on the predetermined amounts for each quality of service classes.

23. (Original) The system of claim 21, wherein the allocation unit is further adapted to identify a plurality of quality of service classes, assign the channelization codes and the portions of the available power for a first class of the quality of service classes, determine a remaining amount of the available power after the assigning for the first class, and assign the channelization codes and the portions of the available power for a second class of the quality of service classes based on the remaining amount of available power.

24. (Original) The system of claim 21, wherein the allocation unit is further adapted to identify a plurality of quality of service classes, combine all users in the plurality of quality of service classes, sort the combined users based on a fairness algorithm, and assign the channelization codes and the portions of the available power based on the sorting of the combined users.

25. (Currently Amended) The system of claim 16, wherein the allocation unit is further adapted to generate a cost function using a channel capacity equation having a first constraint, the cost function including a first optimization parameter associated with the first constraint, determine a value for the first optimization parameter based on a first order derivative of the cost function, and assign at least one of the number of channelization `[[code]]` codes `[[and]]` or the

portions [[portion]] of power available for communicating based on the first optimization parameter.

26. (Currently Amended) The system of claim 25, wherein the first constraint and first optimization parameter are associated with the power available for communicating, and the allocation unit is further adapted to ~~assign at least one channelization code to each of a plurality of data packets, assign portions of the power available to at least a subset of channelization codes based on a plurality of channel quality metrics, and~~ determine the portions of the available power to be assigned based on the first optimization parameter.

27. (Original) The system of claim 26, wherein a second constraint is defined for the channel capacity equation based on the channelization codes, the cost function includes a second optimization parameter associated with the second constraint, and the allocation unit is further adapted to determine the values of the number of channelization codes assigned to the data packets based on the second optimization parameter.

28. (Currently Amended) A system, comprising:

an allocation unit adapted to assign at least one channelization code to ~~a data packet~~ each  
of a plurality of data packets; ~~[[and]]~~

means for assigning ~~at least a portion~~ portions of power available for communicating  
over a channel to at least a subset of the channelization codes ~~[[code]]~~ based on a  
plurality of channel quality metrics ~~[[metric]]~~ associated with the data packets  
~~[[packet]]~~; and

means for iteratively determining values for the portions of the power and the number of  
channelization codes to optimize a capacity of a channel for communicating the  
data packets.

29. (Currently Amended) The system of claim 21, further comprising:

means for determining a number of channelization codes assigned to each of ~~[[a]]~~ the  
plurality of data packets based on a size of the data packet and a channel quality  
estimate associated with each data packet;

means for assigning portions of the power available to at least a subset of the  
channelization codes based on a first optimization parameter; and

means for iterating the determining of the number of channelization codes and the  
determining of the portions of the available power.